Oct. 8, 1957 N. KRAG 2,809,032

SHEET-SEPARATING APPARATUS

Filed Dec. 21, 1955 5 Sheets-Sheet 1

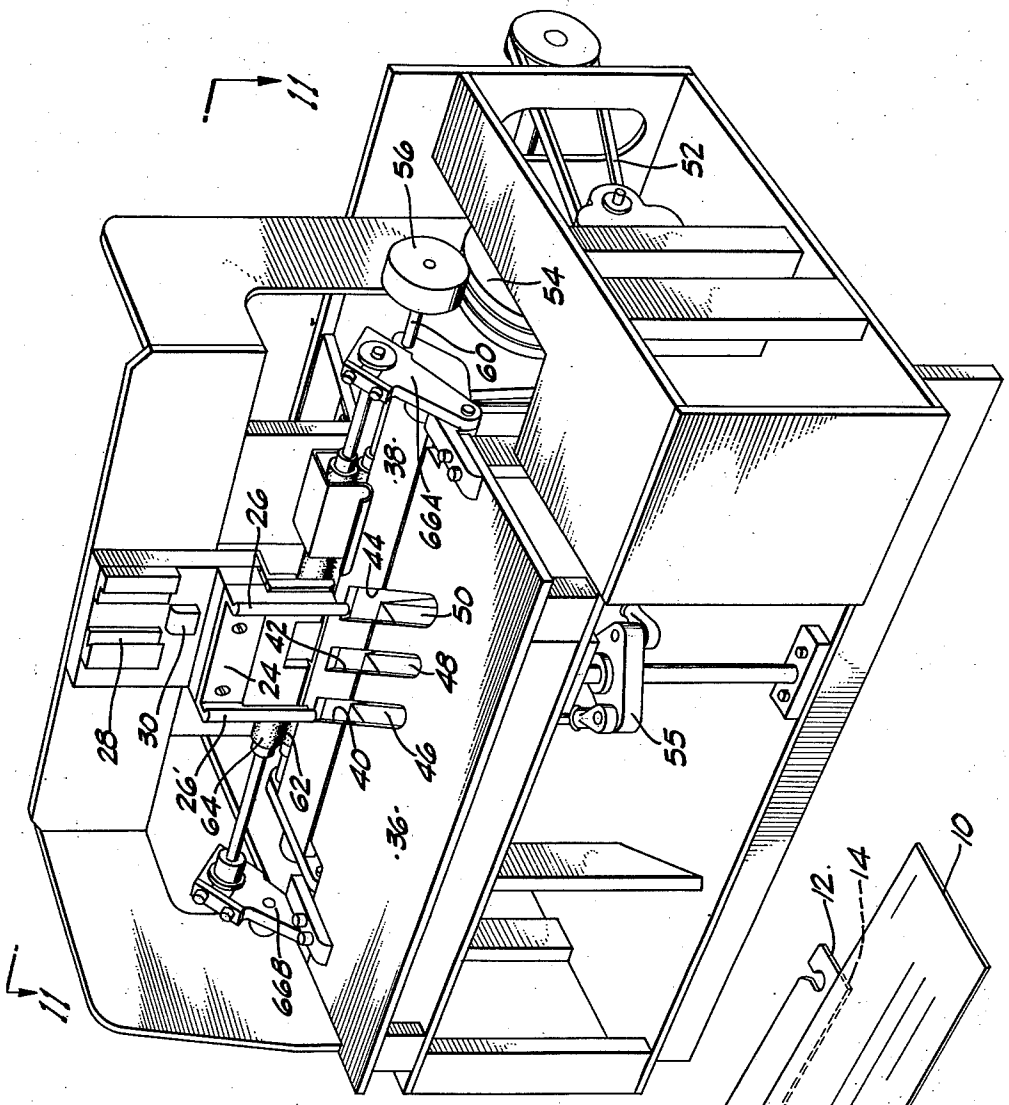


FIG. 4.

FIG. 1.

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SHEET-SEPARATING APPARATUS

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FIG. 1.

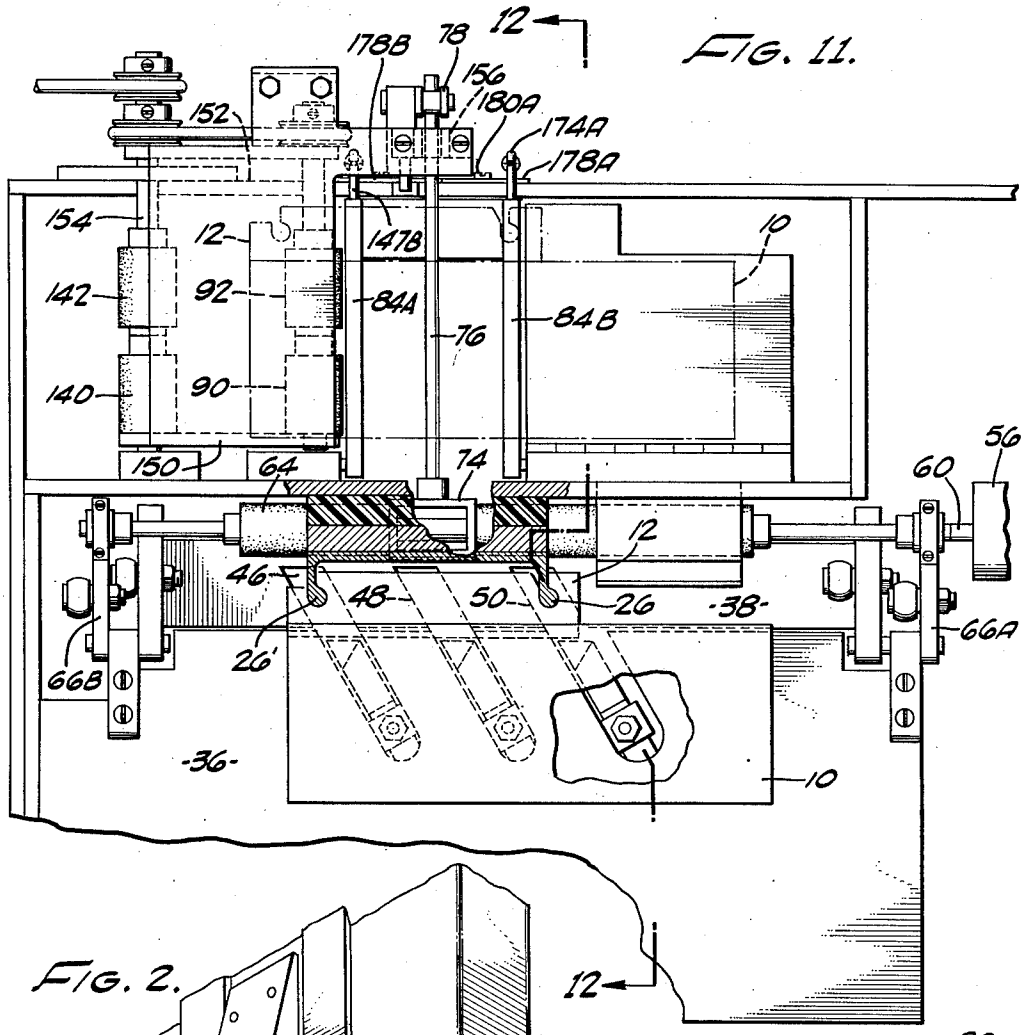


FIG. 2.

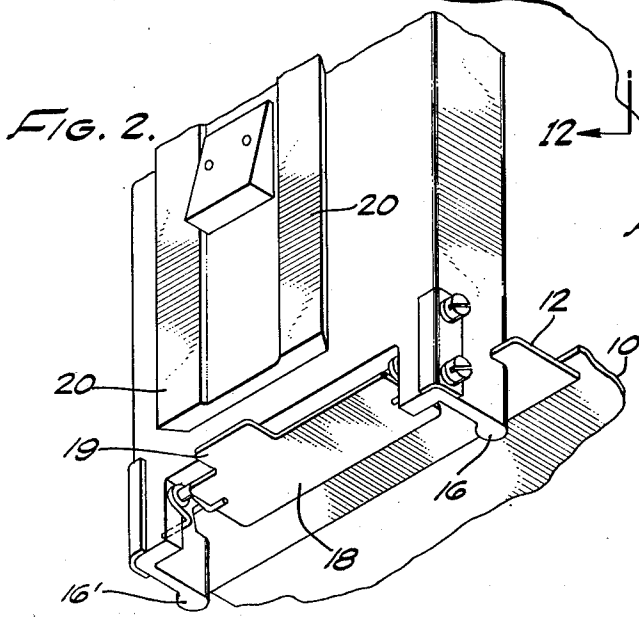
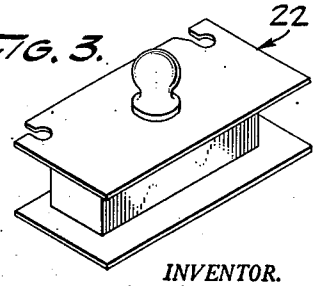


FIG. 3.

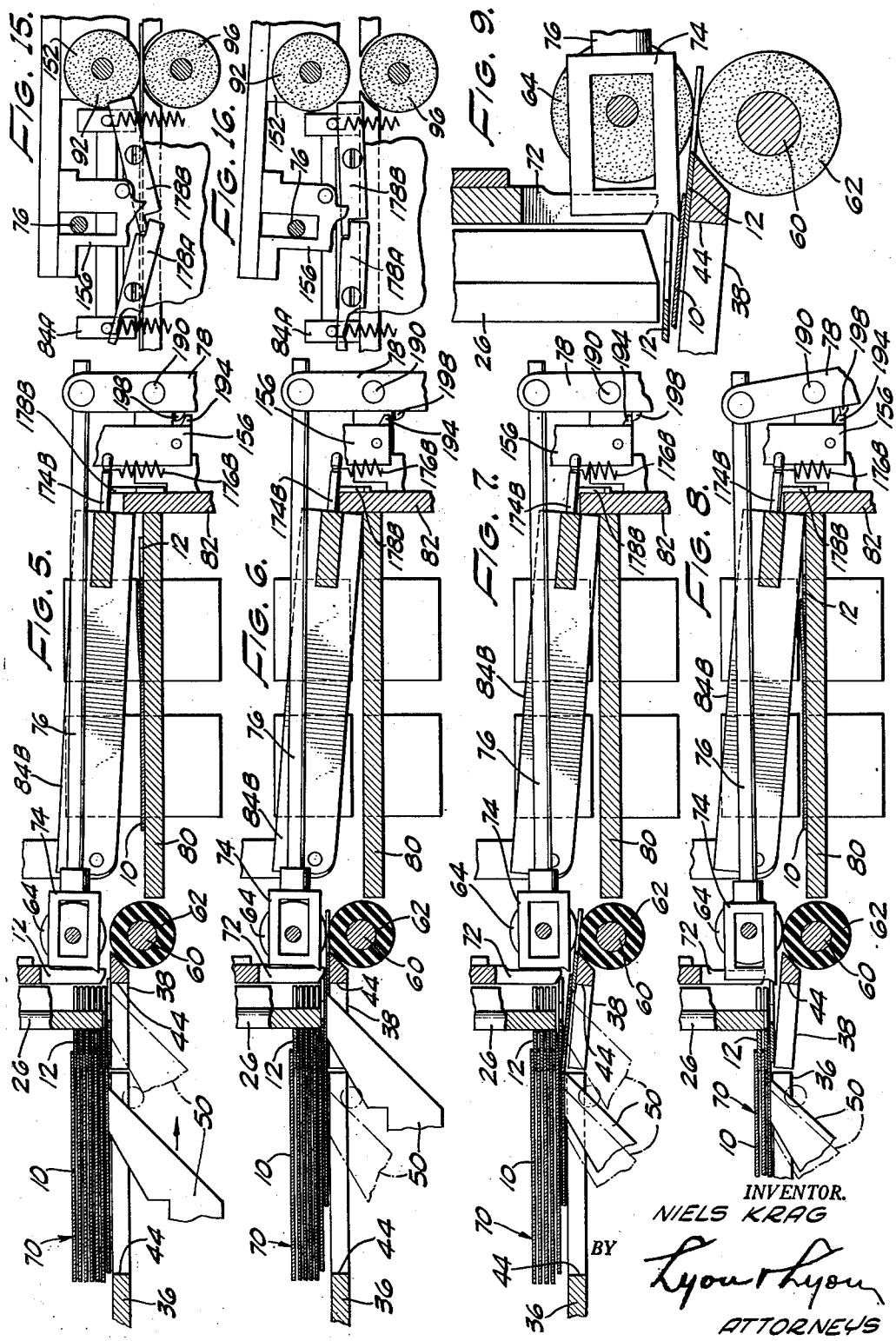


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SHEET-SEPARATING APPARATUS

Filed Dec. 21, 1955 5 Sheets-Sheet 3

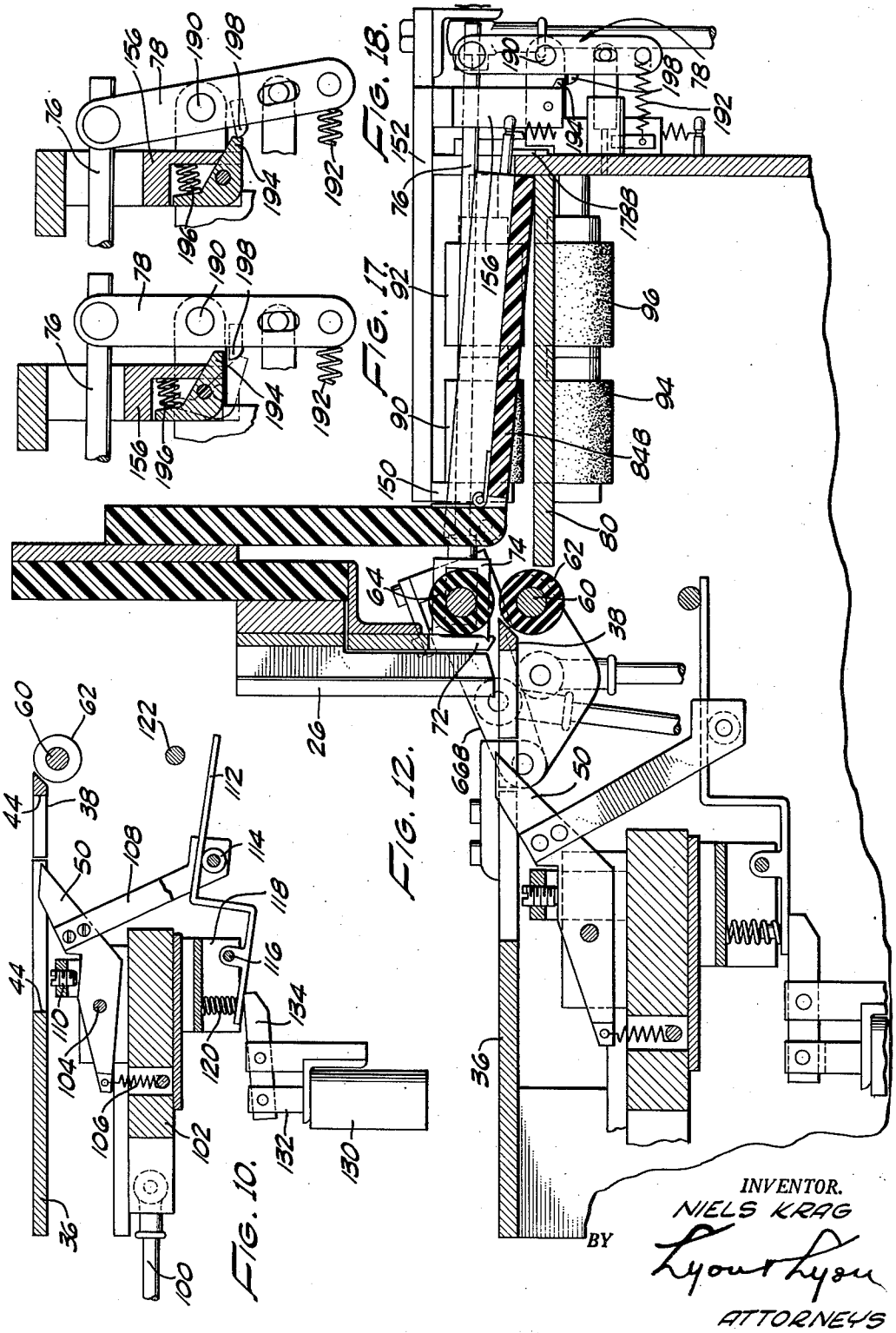


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SHEET-SEPARATING APPARATUS

Filed Dec. 21, 1955 5 Sheets-Sheet 5

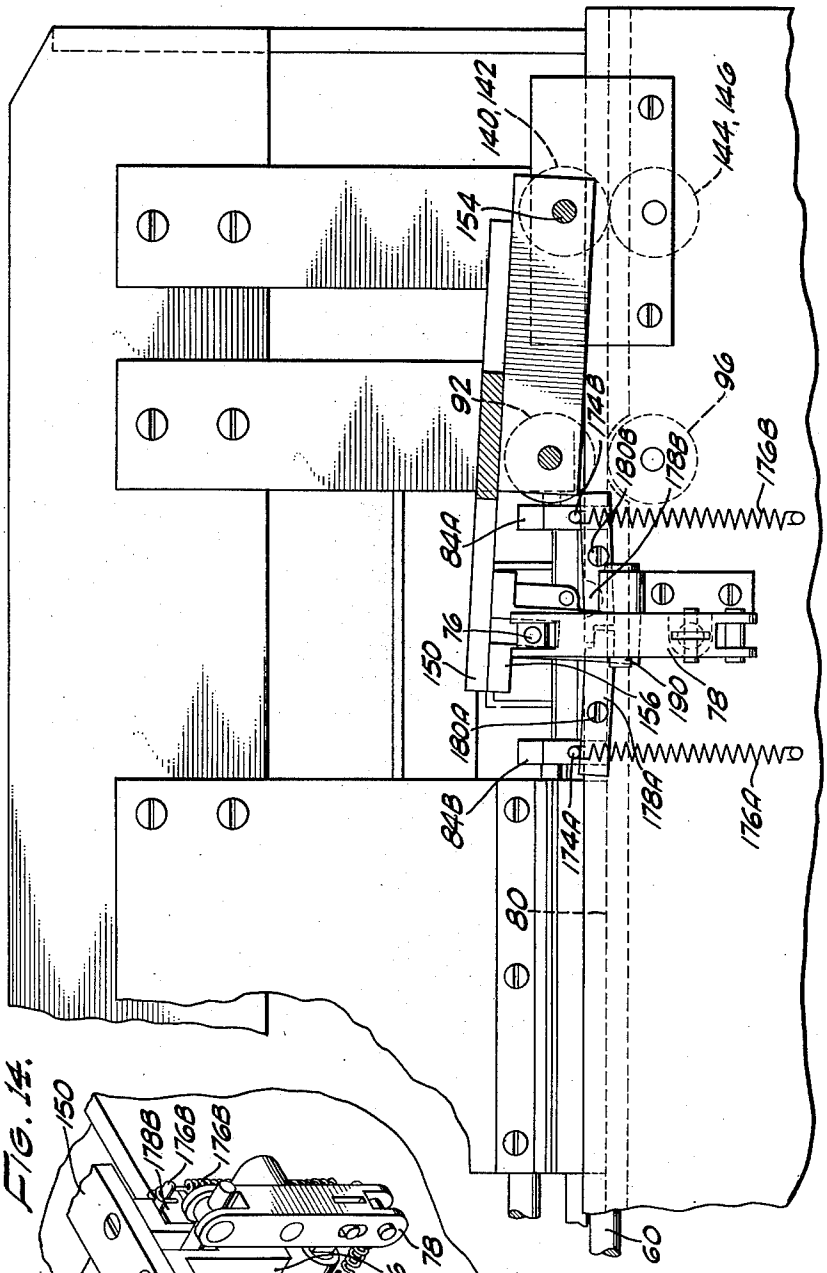


FIG. 13.

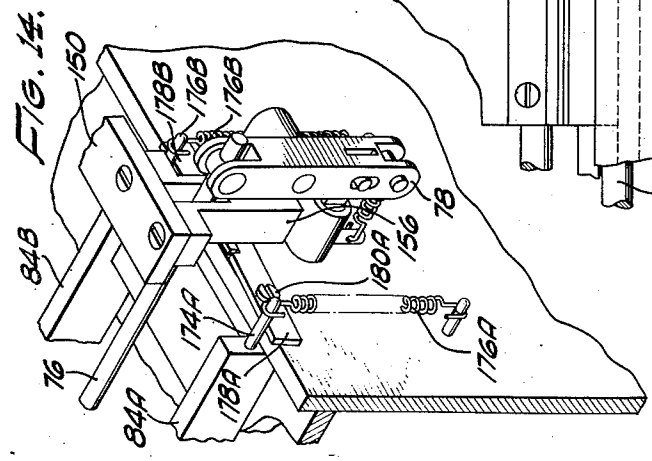


FIG. 14.

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2,809,032

SHEET-SEPARATING APPARATUS

Niels Krag, Pacific Palisades, Calif., assignor to International Telemeter Corporation, Los Angeles, Calif., a corporation of Delaware

Application December 21, 1955, Serial No. 554,481

7 Claims. (Cl. 271—1)

This invention relates to apparatus for separating sheets of material, such as paper, singly from a stack of sheets and, more particularly, to apparatus for separating sheets of paper from each other which have a tab attached to one side of each of said sheets.

In an application for a Computing System, by Peter Van Horne Serrell, filed September 20, 1954, bearing Serial Number 456,960, and assigned to a common assignee, there is described and claimed a tab for checks which is affixed to checks after they are returned to a bank. The data which is on a check such as the branch bank number, depositor's account number, amount of the check, etc., may be applied to the tab in coded form, to permit automatic, or machine processing, of the check from the coded data on the tab. In another application for a Cartridge, by Peter Van Horne Serrell, filed September 20, 1954, bearing Serial Number 457,238, and assigned to a common assignee, there is described and claimed apparatus for holding a batch of checks by means of holes which are perforated in the tabs attached to the checks. These cartridges provide a convenient arrangement for carrying a batch of checks from place to place while preserving the order of the checks in the batch.

In the system for automatically processing these tab-bearing checks, it is necessary to feed these checks singly into the processing apparatus from the cartridges.

An object of this invention is to provide apparatus for removing tab-bearing checks one at a time from a batch of checks.

Another object of this invention is to provide apparatus for unloading a cartridge bearing checks one check at a time.

Still another object of this invention is the provision of apparatus capable of separating sheets one at a time from a stack of sheets all having a tab affixed to one end and then aligning the separated sheets.

These and other objects of this invention are achieved by power-driven apparatus including a hinged table having a gauging member positioned over the table to define a throat, at the side at which the checks are stacked. The checks are stacked with their tabs toward the throat. Fingers move through slots in the table to urge the bottom check with its tab edge foremost through the throat. The throat is only thick enough to allow a tab to pass therethrough. The hinged-end portion of the table is then moved downward in time to allow passage through the throat of the thickest portion of the tab and check, which is the overlap where they are joined. A blocking member is then moved into play to prevent succeeding checks from following the one being separated from the stack. The separated check is then urged under rollers which move it out to the succeeding apparatus. The machine then recycles for separating the next check from the batch.

The novel features that are considered characteristic of this invention are set forth with particularity in the appended claims. The invention itself, both as to its organization and method of operation, as well as additional objects and advantages thereof, will best be understood from the following description when read in connection with the accompanying drawings, in which:

Figure 1 is a perspective view of a check and tab which are illustrative of those separated by the embodiment of the invention;

Figure 2 is a perspective view of a cartridge for holding sheets by their affixed tabs illustrative of the type unloaded by the embodiment of the invention;

Figure 3 is a perspective view of weight used in unloading the cartridge shown in Figure 2;

Figure 4 is a perspective view of an embodiment of the invention;

Figures 5, 6, 7, and 8 show progressive steps in the operation of the embodiment of the invention to move a bottom sheet through the gauging apparatus;

Figure 9 is a detail showing of the blocking member which functions to insure that sheets are passed only singly;

Figure 10 is a detail view showing an arrangement for moving the fingers which are used in the embodiment of the invention;

Figure 11 is a view in elevation along the lines **11—11** of the embodiment of the invention shown in Figure 4;

Figure 12 is a view in section of the embodiment of the invention along the lines **12—12** of Figure 11;

Figure 13 is a rear view of the roller portion of the embodiment of the invention;

Figure 14 is an enlarged isometric view of the details of the second roller, guide members, and blocking member actuating structure employed in the invention;

Figures 15 and 16 show details and operation of the guide-actuating structure; and

Figures 17 and 18 show details and operation of the blocking member actuating structure.

Figure 1 is a view illustrating the type of tab-affixed sheet upon which the embodiment of the invention operates. It comprises a bank check **10** having attached thereto at one edge a tab **12**. The attachment is obtained by employing a suitable adhesive at the overlap portion **14** of check and tab. The two perforations in the tab enable the check to be loaded and carried about by means of a cartridge.

One end of the cartridge is shown in Figure 2. The other end is the same as the end shown. It has a pair of guide rails **16, 16'** which are shaped to co-operate with the tab of a check and hold it. Checks are slid off and on the ends of the cartridge. The cartridge thus serves to hold a batch or stack of checks. A spring-biased guard **18** at each end serves the function of preventing checks from sliding off the rails **16, 16'**. By pressing on the tab **19** of the guard, the guard pivots outward to permit checks to be removed from the cartridge. The embodiment of the invention shown in Figure 4 has an attachment **28** which receives the tenons **20** shown in Figure 2 mounted on the cartridge to hold the cartridge vertically and in a position to be unloaded. A weight **22**, such as is shown in Figure 3, is slid on the guide rails of a cartridge to press down on the batch of checks being held to insure that there is a check to be unloaded or separated at the other end.

An embodiment of the invention is shown in Figure 4. For holding and unloading a cartridge which may have 1000 checks thereon, there is provided cartridge-receiving stud **24** which has guide rails **26, 26'**. A dovetail **23** receives the tenons **20** and serves to align the cartridge guide rails with those of the stud **24**, whereby these checks are guided to the succeeding portion of the apparatus which separates the checks singly. A trigger plate **30** serves the function of pressing on the tab **19** of the guard

18 to thus pivot it out of position to enable the checks to slide onto the guide rails on the stud.

When a cartridge and its load of checks are in the proper position, the lowermost check rests upon a main table which consists of two parts. A first part **36** is a stationary part, and a second part **38** is a hinged pivoting part. The main portion of the check rests upon the stationary part **36**, and the remainder, including the tab end, rests upon the hinged part **38**.

One of the features of this invention is that it is designed so that checks of varying dimensions can be handled. Check sizes ranging from 2 x 5" to 4 x 9⅜" may be handled. Both portions of the main table have three slots, respectively numbered **40, 42, 44**. In each of these slots there is a finger **46, 48, 50**. These fingers operate in a reciprocating manner to come up under a tab on the check at the bottom of the cartridge and push it forward through a gauging throat. The gauging throat will be described in later figures of the drawing. The check is moved forward by the fingers, and the gauging throat is provided to insure that only a single check with tab affixed at a time can pass therethrough. There is, however, an overlap joint which occurs between the tab and the check itself, for which accommodation must be made. The movable portion of the table pivots downward at the time the overlap portion is advanced into the gauging throat to accommodate for the overlap. It should be noted that the gauging portion of the apparatus has an initial width which accommodates only the tab thickness. The tab is that portion of a check or sheet which is affixed thereto upon its return to a bank for payment. This does not constitute a limitation upon the thickness of the stock to which the tab is affixed, since, in subsequent operation, the table drops to accommodate the overlap portion of the tab and check, thereby enabling the passage and handling of various thicknesses and different sizes of checks or sheets. An embodiment of this invention has even been able to separate envelopes, to which tabs were affixed, without any difficulty.

Power is received from a main drive source (not shown) and applied through a belt **52** through speed-reducing equipment to a friction drive wheel **54** and bell-crank apparatus **55** to convert the rotary motion therefrom in well-known manner to the reciprocating motion of the fingers **46, 48, 50**. The friction-drive wheel **54** rotates continuously. A pickup wheel **56** is attached and supported by the hinged portion of the table **38**. When the hinged portion of the table lowers, after a check has been passed into the gauging throat arrangement, the pickup wheel **56** is forced against the friction-drive wheel **54** and receives a rotary drive for the interval while it is pressed against the wheel. The wheel **56**, via a shaft **60**, then drives rollers **62, 64**, which serve to throw the check forward after it is passed through the gauging arrangement.

The wheel **56**, via the shaft **60**, is connected to a driven roller **62**. Above this driven roller is an idler roller **64**. The idler roller is supported by two hinged end plates **66A, 66B**. The hinged end plates move at the same time that the hinged portion of the table is moved. Therefore, when the table hinged portion is moved downward, the hinged end plates move downward, thus carrying the idler roller with them. By this operation, they carry the idler roller until it closes down upon a check which has been pushed forward by the fingers until it is resting between the idler roller and the driven roller. The check is then thrown forward to the subsequent apparatus.

Figures 5 through 8 show successive steps in the actual operation of separating the lower check from a stack of checks, each having a tab. A stack of checks **70** is shown lying on top of the table, stationary portion **36** and hinged portion **38**. The finger **50** is represented by solid lines in its back position and in dotted lines in its advanced position. As shown, the finger **50** comes up under the lowermost check from just in front of the tab and pushes forward underneath the tab, whereby it can move the lowermost check forward. A gauging block **72** is shown having a chamfered end, whereby the check being pushed forward by the finger **50** is guided underneath. The distance between the gauging block and the table **38** is just sufficient to permit a tab to pass therethrough. The rollers **62** and **64** are shown in their open position in Figure 5, whereby the check which is being pushed forward by the finger **50** may be carried between them.

Figure 6 shows the bottom check after it has been moved forward by the finger **50**, so that its tab portion is between the rollers **62, 64**. The rollers are still not close enough together to affect the check which is between them, nor are they being driven as yet.

Just before the hinged portion of the table lowers to bring the idler roller into opposition with the driven roller, a blocking member **74**, which normally is held in a position so that sufficient space exists between it and the table to enable a check to be fed thereunder, is snapped into operating position by a solenoid (not shown). Normally, the solenoid holds up the blocking member and, when it is released, the blocking member is snapped downward and rests on the top of a check which has just been moved forward by the fingers. This may better be seen in Figure 9. The blocking member is supported from a lever arm **76** which is hingedly attached to a ratchet member **78**, as will be more fully described later.

Figure 7 shows the check in its most advanced position with the finger **50** being withdrawn back to its original starting position. The hinged portion of the table has begun to move downward, whereby the check is bent downward therewith. It will be remembered from the previous description that the idler roller **64** moves down as the hinged portion of the table moves down, and the driven roller **62** moves down to receive a drive at this time. Thereby, both rollers seize the check which is between them and urge it forward onto the succeeding apparatus. This may be seen in Figure 8, whereby the check which was between the rollers has been thrown forward by the rollers to the succeeding table **80**. The separating apparatus then recycles to the original operating position, as shown in Figure 5.

While the preceding operation occurs, the blocking member **74** operates to prevent checks from following the check which is between the rollers. Friction between the lowermost check which is between the rollers and the check above it will operate to carry the next-to-the-lowermost check along with the lowermost check. The gauging block is not altogether successful in preventing this, because of the lowered end of the table **38**. In the operation of the blocking member, its motion is as follows. From a raised position, it is snapped downward onto the top of the lowermost check. It remains on the top of the lowermost check, as shown in Figure 9, as the check is carried forward between the rollers. The chamfered end of the blocking member enables the blocking member to ride over the bottom of the check as it is being pulled forward while preventing the next check from following. The blocking member is also given a thrusting, or jogging, motion to push back the check which is following the bottom check. This thrusting motion is caused by operation of the ratchet member **78**, to which the blocking member is attached. The successive motion of the blocking member is shown in Figures 5 through 8. The blocking member is snapped back into its standby position by a solenoid, not shown, which is excited at the time the table begins to return to its original position. The blocking member, in executing its jogging action as described above, succeeds in pushing back any checks which are following the lowermost check, so that the stack will be aligned and in position for the fingers to grasp the lowermost check again.

In Figures 5 through 8, there is also shown fragmentary views of the succeeding apparatus for handling the check.

As was previously pointed out, the bottom check is thrown by the rollers onto the table **80** and against an aligning member **82**. Above the table are constricting members **84A** and **84B**. They are normally positioned so that when a check is thrown from the two rollers, the constricting members above the table together with the table serves as a funnel to gradually slow down and stop the check and prevent it from bouncing back from the aligning member against the rollers. This is performed by having the constricting members at such an angle with the table that a pinching action is performed upon the tab portion of the check. The aligning member, which is a straight edge, is placed at a distance so that a pinching action occurs just before the edge of the tab on the check reaches the aligning member. It is thus stopped at the aligning member. The rectangles **90, 92, 94, 96** represent rollers, which, as will be more fully described later, close on the check after it has been aligned and urge it forward to the subsequent apparatus. Thus, as shown in Figure 5, the constricting members are raised and the rollers are closed to move ahead a check that has been aligned. Figures 6, 7, and 8 show the rollers apart and the constricting members in lowered position to stop the succeeding check.

Reference is now made to Figure 10 for a more detailed description of the operation of the fingers in urging the checks forward. Only one finger **50** is shown and described. The structure of the others is the same. The lever end **100** of the bell-crank mechanism **55** is shown. This urges a carriage **102** in a backward and forward motion. The finger **50** is supported by and moves with this carriage. The support for the finger is about a fulcrum **104**, so that the finger can also be rotated about this fulcrum as required. One end of the finger has attached thereto a spring **106**, and the other end of the finger has attached thereto a member **108**. An adjustable stop **110** is mounted just above the finger, so that the limits of its travel into the table slot may be controlled as desired. The member **108** is engaged by a deflector arm **112** so that with motion of the finger forward and backward the deflector arm urges the finger downward and upward.

A ball bearing **114** on the end of the member **108** is engaged by the deflector arm and enables the frictionless operation of the device. The deflector arm is rotatably supported by a fulcrum **116** from a stationary block **118**. A compression spring **120** serves the function of pushing down against one extremity of the deflector arm whereby the end adjacent to the finger member is urged upward. The spring also serves the purpose of forcing the deflector arm in a position so that it is always in contact with a bearing **122**, which is attached to the hinged portion **38** of the table to be moved therewith. Accordingly, when the hinged portion of the table moves downward to the position shown in Figure 7, the deflector arm moves downward and pulls along with it the finger via the member **108**.

To review the operation of the fingers, they are moved forward by the carriage **102** to engage and move the lowermost check of a stack forward through the gauge throat opening. The fingers are moved downward from their most forward position, which is when the hinged portion of the table moves down to disengage the lowermost check. They are then retracted and brought back into operating position to engage the succeeding check. This reciprocal motion is provided by the bell-crank lever and the disengaging action is provided when the table begins to descend, pushing down on the deflector members and thus pulling the fingers downward also. The fingers are then pulled back to a position to begin a new operating cycle.

The above-described operation is the normal operation for the apparatus. In the event of a jam or other extraordinary occurrence, it is possible to lower the fingers and thus override the normal operation. This is achieved by means of a solenoid **130**, which actuates an armature **132** to which a lever **134** is attached. The lever is pushed upward against the side of the deflector member, which is also engaged by the compression spring. This action overrides the force of the compressing spring, thereby pulling the fingers downward and maintaining them in this disengaged position until the excitation of the solenoid **130** is released.

Figure 11 is a plan view of the apparatus along the lines **11—11** in Figure 4. A check may be seen in position before the fingers **46, 48, 50** have advanced it, and, also, a second check may be seen in the position to which it is thrown by the rollers **62, 64**. The second set of rollers **90, 92** are also shown in position to operate upon the check which has already passed through the first set of rollers **62, 64**. It should be appreciated from this drawing that the bottom check is moved by the fingers at a 30° angle. Because of the angular motion, check separation is made much easier and much more positive, especially when the checks which are to be separated are of varying sizes. After the check is passed through the first set of rollers, it is seized by the second sets of rollers **90, 92, 94, 96** and moved in a direction at right angles to the direction of motion after it has passed under the first set of rollers. A third set of rollers **140, 142, 144, 146** follows the second set of rollers **90, 92, 94, 96**. This third set of rollers remains in position, rotating at all times, to grasp and pass forward, still in alignment, checks which have been urged toward them by the rollers **90, 92, 94, 96**.

In connection with the description of Figures 5 through 8, it was described that the rollers **90, 92** were first spaced apart so that a check could be thrown between them by the rollers **62, 64**. This can also be seen in Figure 12, which is a view in section taken along the lines **12—12** of Figure 11. This view shows the fingers and table in the retracted position and the rollers **90, 92** separated from the rollers **94, 96**. The guide members **84** are in the pinching position. When the pinching action of the guide members **84** is relieved, the second set of rollers are moved together to then urge the check forward toward the third set of rollers. Actually, what occurs is that the upper rollers **90, 92** are moved downward upon a check in a hinging type of operation. As may be seen from the rear view of a section of the embodiment of the invention shown in Figure 13, the support members **150, 152**, which carry the rollers **90, 92**, are fulcrumed on the shaft **154** of rollers **140, 142**. A pull-down member **156**, which is attached to the support members, is actuated via a bell-crank lever (not shown) to pull down the rollers at the proper time. Simultaneously therewith, the pinching operation of the guide members is released, and a ratchet, or thrusting, motion is made by the blocking member **74** to cause it to jog any checks following the bottom one back to the stack of checks.

Referring now to Figure 14, there may be seen an enlarged isometric view of a portion of Figure 13 which includes the actuating structure for the second pair of rollers, the constructing members, and the blocking member. The details of the guide member actuating structure are shown in Figures 15 and 16, and the details of the blocking member actuating structure are shown in Figures 17 and 18.

Describing now the constricting-member actuating structure, as may be seen from Figures 5 through 8 and in Figure 12, the constricting members are hingeably supported at the ends closest to the first set of rollers **62, 64**. As seen in Figure 14, a pin **174A—174B** respectively extends from each of the other ends of the constricting members. Springs **176A—176B** are attached to the pins and pull down on them to bias the constricting members in the constricting position. To raise the constricting members from this position, two lever arms **178A—178B**, as may be seen in Figures 15 and 16, are employed. Each of these lever arms has a fulcrum **180A—180B** with one end of each lever arm being in

contact with its associated pin and the other ends being interlocked. When the pull-down member **156** is pulled down to bring rollers **92** and **96** together, it presses down on the lever member **178B**. This pivots about its fulcrum **180B** and, by virtue of the interlock coupling, causes lever arm **178A** to pivot about its fulcrum **180A**. Thus, the lever arms push against the pins **174A**, **174B**, counteracting the pull-down effect of the springs **176A**, **176B**, and thus raising the constricting members up when the rollers **94**, **96** are being brought together to advance the check between them. Upon the rollers being separated again, the constricting members are pulled down into position again by the springs.

Reference is now made to Figures 17 and 18, to show the manner of deriving a jogging motion for the blocking member. The arm **76** of the blocking member is pivotally attached to the ratchet member **78**. The ratchet member is pivotally attached to a fulcrum **190**. A spring **192** attached to the other end of the ratchet member holds it in a vertical position with the blocking member retracted. The pull-down member **156** has a ratchet finger **194** set therein which is pivotally mounted and biased to the position shown in Figure 17 by the compression spring **196**. The ratchet member **78** has a ratchet pawl **198**. In moving downward with the pull-down member, the ratchet finger **194** moves against the ratchet pawl **198**. This causes the ratchet member **78** to have a rotary motion about the pivot point **190**. Thereby, the rod **76** is jogged, thus jogging the blocking member which pushes back any following checks. The pull-down member **156** continues its downward motion past the pawl **198** until the rollers **90—98** engage the check and move it forward. After this has happened, the member **156** moves upward again. In moving upward, the finger **194** pivots and compresses the spring **196**. The spring **192** serves to return the ratchet member **78** and the blocking member to its initial position.

While the embodiment of the invention has been described as one wherein a stack of tab-carrying checks which are on a cartridge are separated singly, it will be appreciated that the invention here is not to be so limited. A cartridge is not necessary. Any stack of documents of various lengths and widths and having a thickness variation which can be seized by the fingers may be separated by this embodiment of the invention. It is merely required that the stack be placed over the stationary and movable portions of the table where the fingers can urge the bottom sheet through the gauging throat. The movable portion of the table then pivots downward to allow for passage of the thicker portion of the sheet through the gauging throat. The bottom sheet is then seized by the first pair of rollers and thrown against the aligning edge while the blocking member jogs back any sheets that may follow. The constricting members prevent bounce-back and slow up the sheet that has passed through the first set of rollers. The constricting members are then lifted and a second set of rollers close on the sheet and move it along the aligning edge under a third set of rollers, which move it still in alignment to a succeeding apparatus. In an embodiment of the invention which was built sheets were separated at the rate of five per second and passed to succeeding equipment at this speed.

There has accordingly been described and shown herein novel and useful apparatus for rapidly separating sheets from a stack, one at a time, and aligning the sheets and then passing them to other apparatus.

I claim:

1. Apparatus for separating sheets one at a time from a stack each sheet bearing a tab which is adhered to one edge of a sheet, said apparatus comprising means defining a throat having a thickness to permit only a tab to pass therethrough, said means including a table having a stationary portion and a movable portion hinged thereto, and a gauging member positioned over said movable portion a distance equal to said throat thickness, means to urge the bottom sheet of a stack with its tab foremost into said throat, means to widen said throat to permit the passage therethrough of the overlap portion of said bottom sheet and tab including means to lower the movable portion of said table, means to block sheets on top of said bottom sheet from following said bottom sheet, and means to advance said bottom sheet to a succeeding position after it has passed through said throat.

2. Apparatus for separating sheets one at a time from a stack each sheet bearing a tab which is adherent to one edge of a sheet, said apparatus comprising a table including a stationary portion and a movable portion hingeably attached thereto, a plurality of slots in said table, a gauging member positioned over said movable portion a distance equal to said throat thickness, a plurality of fingers, one for each slot in said table movably mounted under said table, means for urging said plurality of fingers to extend through said slots to engage and move under said gauging member the bottom one of a stack of sheets, means for lowering the movable portion of said table for enabling passage beneath said gauging member of the overlap portion of a sheet and tab, a blocking member, and means to move said blocking member to push back any sheets following said bottom sheet.

3. Apparatus for separating sheets one at a time from a stack each sheet bearing a tab which is adherent to one edge of a sheet, said apparatus comprising a table including a stationary portion and a movable portion hingeably attached thereto, a plurality of slots in said table, a gauging member positioned over said movable portion a distance equal to said throat thickness, a plurality of fingers, one for each slot in said table movably mounted under said table, means for urging said plurality of fingers to extend through said slots to engage and move under said gauging member the bottom one of a stack of sheets, means for lowering the movable portion of said table for enabling passage beneath said gauging member of the overlap portion of a sheet and tab, a blocking member, means to move said blocking member to push back any sheets following said bottom sheet, an aligning edge, roller means to throw against said aligning edge a sheet which has passed between the gauging member and the table, means to prevent a sheet from bouncing back from said aligning edge, and second roller means to advance said aligned sheet to succeeding apparatus.

4. Apparatus for separating sheets as recited in claim 3 wherein said means to prevent a sheet from bouncing back from said aligning edge includes a pair of longitudinally extending members each having one end hingeably supported near said first roller means, spring means attached to the other end of each of said longitudinally extending members to bias said other end of said aligning edge a distance therefrom to provide a gradually constricted passage between said first roller means and said aligning edge, and means to elevate said other end to enable said sheet to be removed from under said longitudinally extending members.

5. Apparatus for separating sheets one at a time from a stack each sheet bearing a tab which is adherent to one edge of a sheet, said apparatus comprising a table having a stationary portion and a movable portion hingeably attached thereto, a plurality of slots in said table, a gauging member positioned over one end of the movable portion of said table a distance to permit a tab to pass thereunder, a plurality of fingers positioned beneath said table, means to reciprocally move said finger to extend through said table to engage the bottom sheet of a stack by its tab and urge it between said gauging member and said one end of said table, means for lowering said movable table portion to accommodate the overlap thickness of tab and sheet, a first pair of rollers positioned

to receive a sheet therebetween as it passes from under said gauging member, an aligning edge, means to energize said first pair of rollers when said movable table portion is lowered to throw the sheet therebetween against said aligning edge, a blocking member, means for jogging said blocking member against sheets following a bottom sheet to prevent such follow, constricting members, means positioning said constricting members over said aligning edge to stop a sheet which has been thrown at said aligning edge, a second pair of rollers positioned to receive a sheet therebetween which has been thrown against said aligning edge, means to move said constricting members from said position for stopping a sheet, and means for closing said second pair of rollers on a sheet therebetween to advance it to a succeeding position.

6. Apparatus as recited in claim 5 wherein said slots in said table and the motion of the fingers therein are at an angle to the stack of sheets from which sheets are being separated.

7. Apparatus as recited in claim 5 wherein said constricting members are a pair of longitudinally extending members each having one end hingeably supported near said first pair of rollers, each having a pin extending from its other end, a second table over which said constricting members are supported, said aligning edge being positioned at one edge of said table under the other ends of said constricting members, and said means positioning said constricting members over said aligning edge to stop a sheet which has been thrown at said aligning edge includes spring means attached to said pins to yieldably bias said other ends of said constricting members in proximity to said aligning edge a distance to provide a gradually constricted passage between said second table and said constricting members.

References Cited in the file of this patent

UNITED STATES PATENTS

1,684,389 Ford ---------- Sept. 18, 1928